SUMMARY OF RESULTS FROM THE CALIFORNIA PESTICIDE ILLNESS SURVEILLANCE PROGRAM
- 2003 -

HS-1857

California Environmental Protection Agency
Department of Pesticide Regulation
Worker Health and Safety Branch
1001 I Street
Sacramento, California 95814

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Executive Summary

The California Department of Pesticide Regulation's Pesticide Illness Surveillance Program (PISP) seeks to identify all types of pesticide illnesses. While DPR strives to find as many individual reports on illnesses and injuries as possible, with available resources, our primary goals are to identify illness scenarios that warrant action; and to promote pro-active, health-protective measures, especially for workers who frequently face high pesticide exposure risks due to the nature of their employment.

The 2003 PISP summary continued to capture a broad range of pesticide illness scenarios in California, although the number of investigations declined in comparison to 2002. (A total of 1,232 cases were investigated in 2003, with pesticide exposure suspected or confirmed in 802 cases. In 2002, there were 1,859 investigations, with 1,316 suspected or confirmed.)

The number of suspected pesticide residue injuries to farm field workers in 2003 decreased from 2002 (58 compared to 78). Such field worker cases have declined dramatically since the 1980s, although DPR has made substantial efforts to identify these illnesses. DPR maintains a high degree of confidence that PISP captures the majority of agricultural pesticide illnesses, and virtually all cases in which multiple victims seek medical treatment for the same incident.

DPR continues to emphasize the reporting of pesticide drift incidents, agricultural and non-agricultural. The number of suspected or confirmed drift illnesses declined in 2003 compared to 2002 (256 cases and 33 episodes, compared to 478 cases and 39 episodes).

However, pesticide drift remains a major policy issue, as evidenced by Senate Bill 391 (Florez, D-Fresno). SB 391 was signed by Gov. Schwarzenegger in 2004 and took effect on January 1, 2005. The legislation was prompted by rural community drift incidents. SB 391 requires responsible parties to pay for emergency medical treatment when pesticide misuse injures innocent bystanders, and it offers incentives for responsible parties to provide immediate medical aid before the case is adjudicated.

Fumigants are often associated with drift incidents. In 2003, one such drift incident in Kern County involving the use of chloropicrin resulted in 165 suspected illnesses. DPR and the U.S. Environmental Protection Agency are currently cooperating to develop risk assessments for six fumigants (1,3-dichloropropene, chloropicrin, dazomet, metam-sodium and its breakdown product methyl isothiocyanate, methyl bromide, and methyl iodide). In addition, DPR is preparing mitigation measures for metam-sodium that are expected to form the basis for new use restrictions.

Of the total 802 suspected or confirmed illnesses in 2003, 405 (50.5 percent) involved the use of agricultural pesticides, and 397 (49.5 percent) involved non-agricultural pesticide exposure. Occupational exposures accounted for 553 (69 percent) of the 803 cases.

Suspected or confirmed non-occupational illnesses fell dramatically from 2002 to 2003 (523 to 249). That coincided with the end of a project in which California Poison Control System (CPCS) phone operators provided DPR with illness information from physicians. The project lapsed when a federal grant ran out and DPR faced its own budget constraints. Physician reporting is another factor in the decline of non-occupational illness statistics. DPR researchers have for years highlighted problems with physicians who fail to report suspected pesticide illnesses to their county health officers within 24 hours, as required by state law.

In the fall of 2004, DPR began participating in a project with the Office of Health Hazard Assessment (OEHHA) to improve the timeliness, quality, and completeness of illness reporting. Funded by a $750,000 grant from the U.S. Environmental Protection Agency, the project will seek to reestablish a working relationship with CPCS, train physicians to better recognize and report suspected pesticide illnesses, enhance reporting with Web-based tools, and create a Web-based system for pesticide incident investigation in cooperation with the County Agricultural Commissioners.

DPR also has reorganized and enhanced its online resources for physicians at <www.cdpr.ca.gov/docs/whs/physician.htm>.

Other health-and-safety oriented initiatives and research conducted by DPR:

-- An analysis of nine years of illness data completed in 2003 confirmed problems with early agricultural worker re-entry into treated fields. As a result, DPR began developing new hazard notification ("right to know") requirements that will be formally noticed as regulations later this year. The goal is to significantly reduce illnesses from early re-entry through improved communication between applicators and growers.

-- In 2003 and 2004, DPR conducted presentations on pesticide labels and appropriate pesticide incident response for emergency medical responders in San Diego, Orange, and Riverside counties. Other presentations were made to County Agricultural Commissioners and members of industry on the proper use of personal protective equipment and respiratory protection.

-- DPR redesigned and rewrote its Pesticide Safety Information Series leaflets in 2004 to make them more easily understood by farm workers. The 18 handouts in English and Spanish are available at County Agricultural Commissioner offices or found online at <www.cdpr.ca.gov/docs/whs/psisenglish.htm>. Employers' compliance information has been updated and enhanced online at <www.cdpr.ca.gov/docs/quicklinks/compliance.htm>.

-- In 2003, DPR helped the Fresno County Agricultural Commissioner's office produce a series of worker safety videos in English, Spanish, and Hmong.

-- A 2004 DPR survey of County Agricultural Commissioners revealed that more than 10,000 California farm workers speak Punjabi, a language of India. Worker safety leaflets will be translated into Pujabi and distributed later this year.

-- A training video for Mixtecs -- indigenous Indians from the Mexican state of Oaxaca who have no written language -- was produced by the Fresno Agricultural Commissioner with a $50,000 federal grant secured by DPR. Tens of thousands of Mixtecs work in Central Valley fields. The Mixtec videos were aired on a Fresno TV station in 2004 with a live, question-and-answer session. Copies of the video will be made available for purchase this year.

Pesticide Illness Surveillance Program – 2003

Background on the Reporting System

The California pesticide safety program, which the Department of Pesticide Regulation (DPR) administers, is widely regarded as the most stringent in the nation. Mandatory reporting of pesticide[1] illnesses has been part of this comprehensive program since 1971. It is the oldest and largest program of its sort in the nation, and supplies data to regulators, advocates, industry, and individual citizens.

The U.S. Environmental Protection Agency (U.S. EPA) and the National Institute for Occupational Safety and Health (NIOSH) have encouraged other states to develop programs similar to California's. Through NIOSH's Sentinel Event Notification System for Occupational Risk (SENSOR), they now partially support programs in the states of Massachusetts, Michigan, New Mexico, New York, Oregon, Texas, and Washington. SENSOR also provides technical assistance to the states of Arizona, Florida, and Louisiana, and supports pesticide-related work by the Occupational Health Branch of the California Department of Health Services, which coordinates with DPR's Worker Health & Safety Branch (WH&S). As yet, most of these programs have collected only limited numbers of case reports, and U.S. EPA still relies heavily on California data for evidence of pesticide-related adverse effects.

DPR scientists participate in the national working group on pesticide illness surveillance that NIOSH convened to develop standards for information collection. DPR's 1998 expansion of the Pesticide Illness Surveillance Program (PISP) database incorporated several features from the NIOSH standards.

DPR scientists developed a set of validation rules during 2002 to assure internal consistency in the database. In 2003, DPR scientists completed review of all data entered from 1992 through

[1] "Pesticide" is used to describe many substances that control pests. Pests may be insects, fungi, weeds, rodents, nematodes, algae, viruses, or bacteria -- almost any living organisms that cause damage or economic loss, or transmit or produce disease. Therefore, pesticides include herbicides, fungicides, insecticides, rodenticides, and disinfectants, as well as insect growth regulators. In California, adjuvants are also subject to the regulations that control pesticides. Adjuvants are substances added to enhance the efficacy of a pesticide, and include emulsifiers, spreaders, and wetting and dispersing agents.

2002 to verify that the validation rules can be fully implemented. Data earlier than 1992 have not been revised to incorporate the 1998 database upgrades, and will be presented only when historical perspective is important.

Excessive exposure to pesticides may cause illness by various mechanisms, and the surveillance program attempts to monitor all of them. Every pesticide active ingredient has a pharmacologic effect by which it controls its target pests. Pesticide products may have other potentially harmful properties in addition to the qualities designed to control pests. PISP collects information on adverse effects from any component of pesticide products including the active ingredients, inert ingredients, impurities, and breakdown products. Whether pesticide products act as irritants or as allergens, through their smell or by causing fires or explosions, DPR's mission is to mitigate exposures that compromise health.

DPR maintains its surveillance of human health effects of pesticide exposure in order to evaluate the circumstances of pesticide exposures that result in illness. The PISP database provides the means to identify high-risk situations warranting DPR action including implementing additional California restrictions on pesticide use. For example, taking illness data into consideration, DPR may adjust the restricted entry interval following pesticide application, specify buffer zones or other application conditions, or require pesticide handlers to use protective equipment that meets certain standards. Review of illness investigations concerning irrigators (McCarthy, 2003) followed up on earlier evaluations of notification regulations and reentry illnesses (Spencer, 2001, McCarthy, 2002). An inquiry from a county agricultural commissioner (CAC) led to review of episodes involving chlorine used as a pesticide for pool and spa sanitation (Schneider, 2003). Another CAC requested assistance in evaluating the circumstances that led to illnesses in a food processing facility where a chlorine-based product was similarly used for water sanitation (Fong, 2003).

In some instances, changes to pesticide labels provide the most appropriate mitigation measures, and DPR cooperates with U.S. EPA to develop appropriate instructions for users throughout the country. If an illness incident results from illegal practices, state and county enforcement staff take appropriate action designed to deter future incidents.

Sources of Illness Cases

Under a statute enacted in 1971 and amended in 1977 (now codified as Health and Safety Code section 105200), California physicians are required to report any suspected case of pesticide-related illness or injury by telephone to the local health officer within 24 hours of examining the patient. The health officer informs the county agricultural commissioner (CAC) and also completes a pesticide illness report (PIR), copies of which are distributed to the Office of Environmental Health Hazard Assessment (OEHHA), Department of Industrial Relations (DIR), and DPR. DPR scientists regularly consult the data collected to evaluate the effectiveness of DPR's pesticide safety regulatory programs and assess the need for changes.

DPR strives to ensure that the PISP captures the majority of significant illness incidents and records them in its database. For example, since doctors do not always properly report pesticide cases, DPR also reviews Doctor's First Reports of Occupational Illness and Injury (DFROIIs), which California's Labor Code requires workers' compensation claims payers to forward to DIR. Scientists select for investigation any DFROII that mentions a pesticide, or pesticides in general, as a possible cause of injury. Reports that mention unspecified chemicals are also investigated if the setting is one in which pesticide use is likely. Until recently, two-thirds to three-quarters of the incidents investigated were identified through DFROII review.

For several years, DPR worked with the California Poison Control System (CPCS) to assist in identifying potential pesticide illnesses. Before 2000, DPR scientists managed two pilot projects in which CPCS specialists offered to report pesticide-related illnesses on behalf of physicians. Funds from U.S. EPA supported development of an enhanced system of poison control facilitation, which operated from mid-2001 through November 2002. Cooperation with CPCS identified several hundred exposures that otherwise would have escaped detection, but the State's fiscal crisis prevented continuation of the contract after federal funding ended. Negotiations are in progress for poison control cooperation to resume under a contract with OEHHA using federal funds.

OEHHA's negotiations with CPCS are part of a broader effort to improve pesticide illness reporting. The same funding also supports integrating pesticide-related conditions into the Web-

based system that the Department of Health Services has under development for reporting all notifiable health conditions. Three pilot counties will test Web-based physician reporting of pesticide illnesses in 2005, with the intention of extending the system to the rest of the state thereafter.

The agricultural commissioners of the counties where exposures occurred investigate all identified incidents. They attempt to locate and interview all the people with knowledge of the event, and also review relevant records. Primarily, their investigations determine whether pesticide safety requirements were fully followed. Secondarily, the CAC determines the causes of exposure and characterizes the illness. DPR provides instructions, training, and technical support for conducting investigations. These instructions include directions for when and how to collect samples of foliage, clothing, or surface residues to document environmental exposures. As part of the technical support, DPR contracts with a specialized laboratory to analyze the samples. PISP scientists are working with staff of DPR's Enforcement Branch to update and consolidate the investigation manual that CACs use.

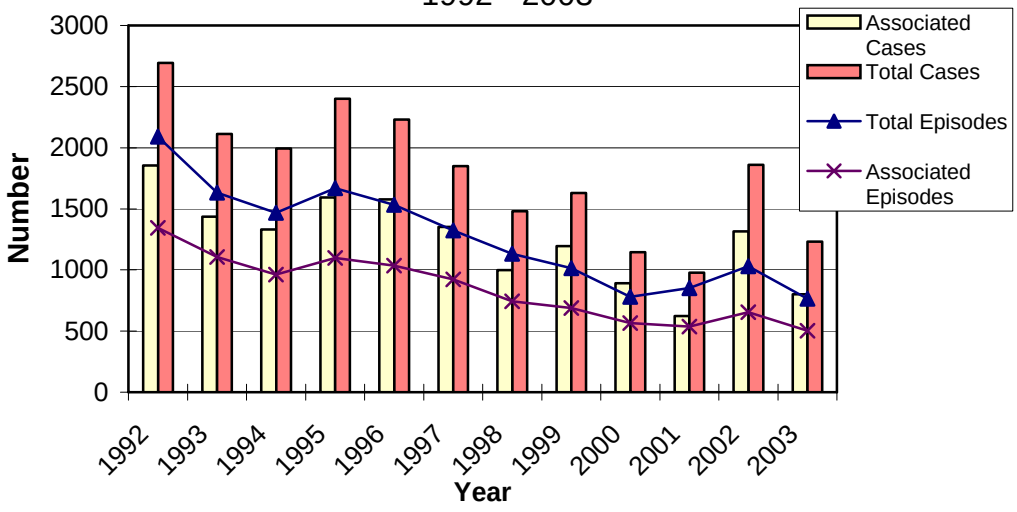
The CACs prepare reports describing the circumstances in which pesticide exposure may have occurred and any other relevant aspects of the case. When appropriate, they request authorization from the affected people to include relevant portions of their medical records with the report. When investigations identify additional affected people (not previously reported by other mechanisms), they are identified in the investigation report and recorded in the PISP database. DPR scientists evaluate the physicians' reports and all the information the CACs have gathered. They then classify incidents according to the circumstances of pesticide exposure.

DPR evaluators undertake a complex evaluation of medical records and investigation reports to determine the likelihood that a pesticide exposure caused the incident. Standards for the determination are described in the PISP program brochure, "Preventing Pesticide Illness," which can be viewed or downloaded from the DPR Web site at www.cdpr.ca.gov/docs/whs/pisp/brochure.pdf.

2003 Numeric Results -- Totals

The 1,232 cases investigated in 2003 mark a return to the relatively low levels of recent years, after the spike to 1,859 cases in 2002 (see Figure 1). Loss of assistance from CPCS could account for much of the decrease; it is the most probable cause for the drop from 725 to 303 investigations of suspected non-occupational exposures. Field fumigation again gave rise to a massive episode: DPR collected information on 185 people in the vicinity of a Kern County field fumigation where an application of 100% chloropicrin was not adequately confined (described more fully under drift, below). The odor that prompted 103 people to evacuate a San Bernardino County public health clinic, however, was found not to relate to any pesticide.

Figure 1: Number of Cases vs. Number of Episodes, 1992 - 2003

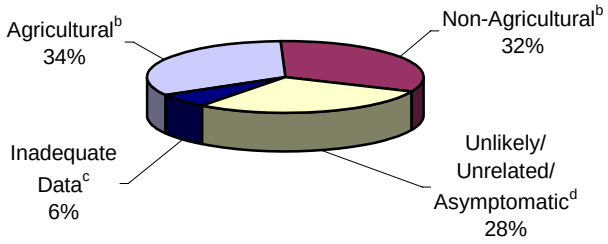


A case is the Pesticide Illness Surveillance Program representation of a person whose health problems may relate to pesticide exposure.
An episode is an event in which a single source appears to have exposed one or more people (cases) to pesticides.
Associated cases are those evaluated as definitely, probably, or possibly related to pesticide exposure. A relationship of definite indicates that both physical and medical evidence document exposure and consequent health effects. Probable relationship indicates that circumstantial evidence supports a relationship to pesticide exposure. Possible relationship indicates that evidence neither supports nor contradicts a relationship
Associated episodes are those in which at least one case was evaluated as associated.

Of the 1,232 cases investigated, DPR found that pesticide exposure had been at least a possible contributing factor to 802 (65 percent). Evidence established an unlikely or unrelated

relationship to pesticide exposure for 351 (28 percent) of the 1,232 cases assigned for investigation. Lack of information prevented evaluation of 79 (6.4 percent) (Figure 2).

Figure 2: Outcome of 2003 Illness Investigations[a]



[a] Total cases investigated = 1232.
[b] *Agricultural* and *Nonagricultural* refers to the intended use of the pesticide.
[c] *Inadequate* means that there was not enough data available or reported to determine if pesticides were involved in the case.
[d] *Unlikely/Unrelated/Asymptomatic* refers to cases determined as unlikely related or unrelated to pesticide exposure or the exposed person did not develop symptoms.

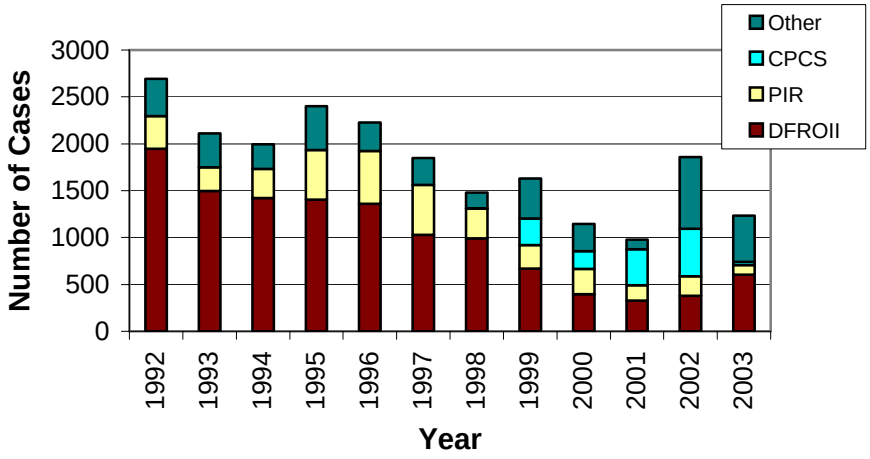
Of the 802 cases recognized as definitely, probably, or possibly related to pesticide exposure, 405 (50.5 percent) involved use of pesticides for agricultural purposes and 397 (49.5 percent) involved pesticide exposure in other situations. Evidence established a definite relationship to pesticide exposure for 152 (19 percent) of the 802 cases. Another 462 (58 percent) were classified as probable, with 188 (23 percent) entered as possible. Tabular summaries presenting different aspects of the data are available through DPR's Web site at www.cdpr.ca.gov/docs/whs/2003pisp.htm, or by contacting the WH&S Branch.

Enforcement actions often are still under consideration when DPR receives the illness investigative reports, and identification of violations is difficult. Based on the information available at the time of evaluation, WH&S scientists concluded that factors already prohibited by pesticide safety regulations had contributed to 400 (50 percent) of the 802 cases evaluated as definitely, probably, or possibly related to pesticide exposure. This includes the 166 people who had symptoms related to the large chloropicrin drift episode and 61 additional people affected by

apparent violations during or following agricultural pesticide use. In circumstances unrelated to agricultural use, evaluators felt that violations contributed to 173 (44 percent) of the 397 definite, probable or possible cases. This indicates the importance of continuing compliance efforts to further reduce pesticide-related illnesses and injuries.

Occupational exposures (those that occurred while the affected people were at work) accounted for 553 (69 percent) of the 802 pesticide-associated cases from 2003. Before 1999, occupational exposures accounted for 90 percent of the cases classified as definitely, probably, or possibly related to pesticide exposure. The relative percentage of occupational vs. non-occupational cases is at least partially the result of case identification sources. Over the last decade the number of cases identified through DFROIIs has decreased dramatically, although it rebounded noticeably in 2003 (Figure 3). DPR scientists investigated the decline in two ways, which are described in the annual report for 2001 (DPR, 2003), but have identified no demonstrable cause for the long-term decrease in case identification by DFROII retrieval.

Figure 3: Number of Cases Reported by Reporting Method



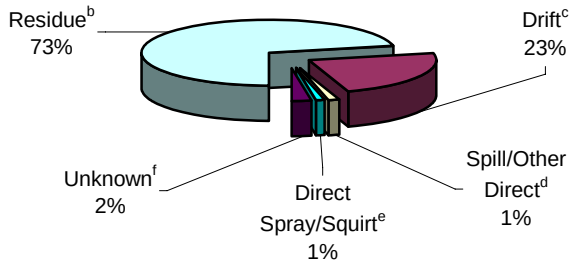
DFROII – Doctor's First Report of Occupational Illnesses and Injury (Workers' Compensation report).
PIR – Pesticide Illness Report (physician reporting).
CPCS – California Poison Control System (facilitated physician reporting).
Other – All other methods of case identification.

Figure 3 also shows that unusual numbers of cases were identified in 2002 and 2003 by mechanisms outside the usual reporting pathways. This occurred because the usual reports come only from medical care providers. Recently, large episodes have occurred in which few of the affected people received medical care. Such episodes come to CACs' attention via news reports or direct citizen complaints; CACs also locate some additional cases in the course of investigating reported illnesses.

Agricultural Field Worker Incidents

In 2003, 81 cases of field worker illness or injury were evaluated as definitely, probably or possibly related to pesticide exposure (Figure 4). Fifty-eight of them (72 percent) were exposed to pesticide residue, and 19 (23 percent) were exposed to drift. In two separate events, equipment malfunctions sprayed one worker and doused another with pesticide as they worked among the crops. Investigators could not identify the manner of exposure for two other workers.

Figure 4: Field Worker Exposure to Pesticides, 2003[a]



[a] Total field worker cases associated with pesticide exposure = 81.
[b] Residue refers to field worker cases associated with exposure to residue on the crops.
[c] Drift refers to field worker cases associated with exposure to drift from a pesticide application.
[d] Spill/Other Direct refers to contact made during an application where the equipment did not propel the pesticide (e.g., spill).
[e] Direct Spray/Squirt refers to contact made when the pesticide is propelled from handling equipment (e.g., direct spray).
[f] Unknown – The exposure circumstances of the individuals are not known.

Eight of the residue exposures were evaluated as probably related to reported health effects; the other 50 field worker residue exposures were evaluated as only possibly related. DPR determined that drift exposure was definitely related to two field workers' symptoms, and

probably caused or contributed to symptoms experienced by nine others. Pesticide drift was a possible factor in eight field worker cases. No field worker illnesses resulted from early reentry or lack of required protective equipment. Other violations were identified as contributing to four field worker exposures.

Drift Exposure

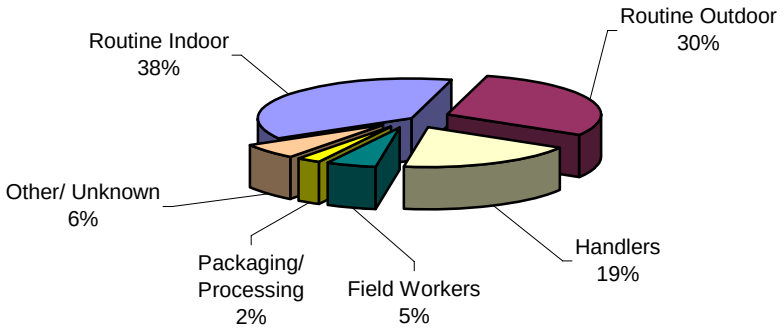
The PISP defines drift exposure as exposure to pesticide "spray, mist, fumes, or odor carried from the target site by air." This definition includes the offsite movement of pesticides after they have been deposited on the target site, so long as the application remains in progress. It also includes exposures of pesticide handlers in which air movement carried the pesticide and caused exposure. In 2003, DPR recorded a total of 363 individuals who reported symptoms definitely, probably, or possibly related to exposure to drift (Figure 5) in 120 separate episodes.

A total of 185 cases were investigated in relation to one Kern County episode, and 166 of them (including two applicators and a field worker) reported symptoms evaluated as definitely, probably, or possibly related to pesticide exposure. Sixteen people denied experiencing symptoms, and three reported atypical symptoms that began earlier than the application did. The incident began after an agricultural pest control business injected 100 percent chloropicrin into the soil of a field to prepare it for planting onions. That evening, residents about a quarter-mile from the fumigation site called for assistance, but the responding fire fighters could not determine what had caused the residents' eyes to itch and burn. The next morning, workers returned to continue the application and discovered, by their own reactions, that fumigant was escaping from the soil. They tried to confine it more effectively by lowering the depth at which it was injected, leaving a 50-foot buffer zone untreated at the field margins, purging lines repeatedly before lifting shanks at the ends of rows, and adding weight to the board that the application tractor pulled behind it in an attempt to compact the soil and contain the fumigant. Nevertheless, residents called for help again that evening. This time when fire fighters arrived, they experienced the same symptoms as the residents. They suspected a soil fumigant and called the agricultural biologist on duty, who quickly determined the source of the irritating vapors and assured the incident commander that no more applications would be permitted before the problem was fully resolved. The agricultural commissioner required the pest control business to

compact the soil immediately using equipment specifically designed for the purpose. After this was completed, no more people developed symptoms and residents were able to reoccupy their homes.

In response to a similar episode, DPR developed guidelines to assist CACs in responding to these incidents. DPR provided the Kern County agricultural commissioner with a draft copy of the guidelines. Investigators tested these new procedures, which include a protocol for systematic case finding and recommendations for ongoing communication. Residents, community activists and local politicians made very positive comments on the overall response. The residents were treated with respect, provided with timely information, and had their questions answered quickly by medical and regulatory experts. The guidelines were finalized and distributed to all CACs in December 2003, and are being incorporated into the commissioners' investigation manual.

Figure 5: Illnesses Associated with Exposure to Pesticide Drift by Activity, 2003



[a] Total drift cases for 2003 = 363.
[b] Field Workers are people working in agricultural fields at the time of drift exposure
[c] Routine Indoor includes people in offices and businesses, residential structures, etc. (occupational and non-occupational) who were not handling pesticides.
[d] Routine Outdoor includes people outdoors (occupational and non-occupational) with little expectation of contacting pesticides (e.g., gardeners not handling pesticides, residents).
[e] Handlers include people mixing, loading and applying pesticides, repairing pesticide equipment and flagging for aerial application.
[f] Packaging/Processing includes people involved in processing harvested crops.
[g] Other/Unknown – Any other type of activity or unknown activity.

Apart from the episode described above, drift exposure was evaluated as definitely, probably, or possibly related to health effects reported by 54 people engaged in routine indoor activities when exposed, 36 people engaged in routine outdoor activities, 18 field workers, 9 workers handling harvested agricultural products, and 13 people involved in other or unknown activities. Additionally, 67 pesticide handlers were definitely, probably, or possibly affected by airborne exposure to the pesticides they handled. Such exposures are recorded as drift.

Overall, agricultural pesticide use was found responsible for 256 drift cases (71 percent), which occurred in 33 episodes (including the chloropicrin episode, which accounted for 166 cases). Other exposure situations accounted for 107 cases (29 percent) in 87 episodes. Of the 69 pesticide handlers exposed via drift, just 10 (including two whose work initiated the chloropicrin episode) were working in agriculture.

Morbidity and Mortality

Among the 614 cases evaluated as definitely or probably related to pesticide exposure, eight people were admitted to hospitals and 70 lost time from work. Of the 188 possible cases, one reported hospitalization and 42 lost work time.

DPR investigated ten deaths in 2003, and found five of them definitely related to pesticide exposure, one probably related, and four unrelated. Coroners identified all but one of the pesticide-related deaths as suicides. One suicide ingested paraquat and three exposed themselves to phosphine. One other apparent suicide most probably ingested aldicarb, but no analysis was performed to confirm this.

One man died of unintentional paraquat ingestion. This tragedy resulted from multiple violations of pesticide safety regulations. Investigators determined that the victim was not licensed to purchase or possess paraquat. They also found that the victim's most recent employer did not appear to be the source of the material, although he may have used careless pesticide handling procedures. The employer did not maintain required pesticide use records, and he assigned

workers to apply pesticides without the training, information, or facilities that regulations require. The decedent seems to have used paraquat at work, but had not been trained to handle it safely. If he had received the prescribed training, he may not have brought a dangerous product home where he lived with his family. Most crucially, he would have learned how absolutely unacceptable it is to place any pesticide into a container that does not fully identify the contents, much less to pour it into a coffee cup as he did. Predictably, he took a sip from that cup, and although he spat it out immediately and went to the hospital about an hour later, efforts to save his life were unsuccessful.

DPR evaluated four deaths as unrelated to pesticide exposure. An aerial applicator, who had been well minutes earlier, crashed for unknown reasons and died of injuries. A ground applicator suffered a fatal heart attack while driving a rig loaded with a pyrethroid insecticide. When a winery security guard began feeling ill, he asked whether he might have been exposed to some pesticide; but when his condition was identified as leukemia, which quickly proved fatal, the question of pesticide exposure was recognized as irrelevant. Finally, initial reports indicated that a man used an aerosol insecticide to set the fire in which he died. Subsequent investigation identified the flammable materials as automotive products.

No children are known to have suffered life-threatening illness from pesticide exposure in California in 2003.

Examples of the Importance of Compliance with Safety Procedures

Severe intoxications typically result from careless and often illegal use of pesticides. This is most dramatically illustrated by the death of the laborer whose employer's casual approach to pesticide use may have resulted in his fatal errors. The only other 2003 reports of severe pesticide toxicity resulted from intentional ingestions. Technically, ingesting pesticide violates label instructions and consequently violates state and federal law, but enforcement efforts could scarcely address this type of violation. More practically, enforcement can be directed towards limiting availability of highly toxic pesticides. For this reason, investigators focus on identifying the sources and storage of pesticides misused for suicides or suicide attempts. DPR instructs

investigators to respect the privacy of families in these difficult circumstances, but encourages them to pursue the dealers or permittees who supply dangerous products to untrained consumers.

Field Fumigant Status

In recent years, CACs and DPR have responded to a series of major episodes of soil fumigant movement off site. In 1999, breakdown products from a soil treatment drifted into the town of Earlimart, forcing the evacuation of more than 100 people. In the course of this episode, emergency responders unnecessarily followed a protocol that called for victims of chemical exposure to strip off their clothes and be decontaminated with water from fire hoses. Two more soil fumigant episodes occurred in 2002. One at a Kern County vineyard affected at least 123 workers. Another near the town of Arvin affected about 250 workers, residents, and visitors, and sent one vulnerable woman to the hospital for a week. With the 2003 episode that affected 166 people, these episodes have attracted public attention and prompted recent legislation (SB 391: Florez and Escutia, Chapter 913, Statutes of 2004) that makes safety regulation violators liable for the medical costs of people affected by off-site movement of pesticides used in production of agricultural commodities. DPR's web site posts an explanation of the law at http://www.cdpr.ca.gov/docs/county/sb391.pdf.

The emergence of fumigant drift as a social issue may result from increasing numbers of residences built among agricultural fields, and increasing replacement of methyl bromide by the powerfully irritating fumigants metam-sodium and chloropicrin. Fumigant drift has a long history in California, however, and has been documented repeatedly in the illness surveillance database. DPR scientists have reviewed environmental data supplied by fumigant registrants, and have developed proposals to mitigate the exposures identified. U.S. EPA also is evaluating fumigants with assistance from DPR. DPR plans to coordinate its mitigation efforts with U.S. EPA.

Status of Poison Control Cooperation

In 2000, DPR received money from U.S. EPA to fund a contract under which CPCS specialists relayed reports of pesticide illness on behalf of physicians who consulted poison control. This contract ended in November 2002, and the state's fiscal situation precluded allocating money to

maintain the relationship. With the termination of the contract, the number of illness reports received through poison control dropped from 508 in 2002 to 33 in 2003. The number of non-occupational cases identified fell from 522 to 249, and the number of cases in children ten years old or younger fell from 107 to 69. DPR and OEHHA, have now received a federal grant to improve the timeliness and accuracy of illness reporting, and negotiations are in progress to reestablish cooperation with CPCS.

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Summary of Illness/Injury Incidents
Reported in California as Potentially Related to Pesticide Exposure
Summarized Statewide and by County of Occurrence[1]
2003

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
TOTALS							
Definite	152	132	9	1	10	26	126
Probable	462	67	299	47	49	274	188
Possible	188	12	55	71	50	105	83
Unlikely	29	1	12	7	9	18	11
Asymptomatic	41	4	21	3	13	26	15
Unrelated	281						
Insufficient	2						
Unavailable	77						
OVERALL	**1232**	**216**	**396**	**129**	**131**	**449**	**423**
COUNTY[5]							
ALAMEDA							
Definite	3	3	0	0	0	0	3
Probable	10	0	2	0	8	0	10
Possible	3	0	1	2	0	0	3
Unrelated	3						
Unavailable	3						
AMADOR							
Probable	1	0	0	0	1	0	1
BUTTE							
Definite	2	2	0	0	0	0	2
Probable	3	2	1	0	0	0	3
Possible	1	1	0	0	0	0	1
Unlikely	1	1	0	0	0	0	1
Asymptomatic	1	1	0	0	0	1	0
Unrelated	1						
Unavailable	1						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
Probable	1	1	0	0	0	1	0
Unrelated	3						
CONTRA COSTA							
Probable	4	4	0	0	0	0	4
Possible	2	0	0	0	2	1	1
Unrelated	1						
Unavailable	2						
DEL NORTE							
Definite	2	2	0	0	0	0	2
Probable	2	0	2	0	0	0	2
Possible	1	0	1	0	0	0	1
Unrelated	1						
EL DORADO							
Definite	3	2	0	1	0	1	2
Probable	2	0	2	0	0	1	1
Possible	4	2	2	0	0	0	4
FRESNO							
Definite	7	7	0	0	0	3	4
Probable	13	6	3	1	3	6	7
Possible	11	0	0	6	5	11	0
Unlikely	4	0	3	0	1	3	1
Unrelated	10						
Unavailable	1						
GLENN							
Definite	1	0	1	0	0	1	0
Probable	2	0	1	0	1	0	2
Possible	7	0	7	0	0	0	7
Unlikely	1	0	0	1	0	1	0
Asymptomatic	3	0	1	0	2	0	3
HUMBOLDT							
Probable	1	1	0	0	0	0	1
Unrelated	1						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
IMPERIAL							
Definite	2	0	2	0	0	2	0
Probable	4	1	3	0	0	3	1
Possible	1	0	0	0	1	0	1
Unrelated	3						
INYO							
Definite	1	1	0	0	0	0	1
Unrelated	1						
KERN							
Definite	5	4	1	0	0	2	3
Probable	185	2	179	2	2	182	3
Possible	23	0	8	13	2	21	2
Asymptomatic	20	0	16	0	4	19	1
Unrelated	8						
Unavailable	3						
KINGS							
Possible	1	0	0	1	0	1	0
Unrelated	1						
LAKE							
Definite	1	1	0	0	0	0	1
Probable	1	0	1	0	0	0	1
Unavailable	1						
LASSEN							
Unrelated	1						
Unavailable	1						
LOS ANGELES							
Definite	31	27	2	0	2	1	30
Probable	44	12	23	3	6	0	44
Possible	19	2	4	6	7	1	18
Asymptomatic	4	1	1	0	2	0	4
Unrelated	29						
Insufficient	1						
Unavailable	18						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
MADERA							
Definite	4	3	0	0	1	1	3
Probable	4	1	2	1	0	3	1
Possible	3	0	0	1	2	2	1
Unlikely	4	0	0	3	1	1	3
MARIN							
Definite	2	1	0	0	1	1	1
Probable	3	1	2	0	0	0	3
Unrelated	1						
MARIPOSA							
Unlikely	1	0	0	0	1	0	1
MENDOCINO							
Definite	2	2	0	0	0	0	2
Probable	3	1	0	1	1	0	3
Possible	2	0	0	1	1	2	0
Unrelated	1						
MERCED							
Definite	3	3	0	0	0	2	1
Probable	7	1	1	3	2	5	2
Possible	18	1	8	5	4	13	5
Asymptomatic	1	0	1	0	0	1	0
Unrelated	8						
Unavailable	2						
MONTEREY							
Definite	4	4	0	0	0	0	4
Probable	14	1	4	6	3	11	3
Possible	13	0	0	13	0	13	0
Unlikely	7	0	7	0	0	7	0
Asymptomatic	1	0	1	0	0	1	0
Unrelated	5						
Unavailable	1						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
NAPA							
Probable	2	1	1	0	0	0	2
Possible	3	1	0	1	1	2	1
Unlikely	1	0	0	0	1	1	0
Unrelated	1						
NEVADA							
Probable	1	1	0	0	0	0	1
ORANGE							
Definite	6	6	0	0	0	2	4
Probable	25	2	5	15	3	14	11
Possible	1	0	1	0	0	0	1
Unrelated	8						
Unavailable	2						
PLACER							
Definite	1	1	0	0	0	0	1
Unrelated	1						
PLUMAS							
Unrelated	1						
RIVERSIDE							
Definite	9	7	1	0	1	2	7
Probable	30	2	19	0	9	19	11
Possible	4	0	0	2	2	2	2
Asymptomatic	2	0	1	0	1	1	1
Unrelated	10						
Unavailable	3						
SACRAMENTO							
Definite	3	3	0	0	0	0	3
Probable	9	2	2	3	2	0	9
Possible	5	1	0	1	3	2	3
Unlikely	3	0	2	1	0	1	2
Unrelated	7						
Unavailable	7						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
SAN BENITO							
Definite	1	1	0	0	0	1	0
Possible	1	0	1	0	0	0	1
SAN BERNARDINO							
Definite	6	6	0	0	0	0	6
Probable	3	3	0	0	0	0	3
Possible	1	0	0	0	1	0	1
Unrelated	111						
Unavailable	4						
SAN DIEGO							
Definite	10	9	1	0	0	0	10
Probable	14	3	10	0	1	8	6
Possible	16	1	7	4	4	3	13
Unrelated	16						
Unavailable	6						
SAN FRANCISCO							
Probable	3	0	1	1	1	0	3
Possible	2	0	0	0	2	0	2
Unavailable	2						
SAN JOAQUIN							
Definite	5	5	0	0	0	3	2
Probable	23	6	15	2	0	16	7
Possible	18	2	11	2	3	13	5
Asymptomatic	2	0	0	0	2	0	2
Unrelated	9						
Unavailable	4						
SAN LUIS OBISPO							
Possible	1	0	0	1	0	1	0
Unavailable	2						
SAN MATEO							
Definite	3	1	0	0	2	0	3
Unavailable	1						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
SANTA BARBARA							
Definite	1	1	0	0	0	0	1
Probable	2	1	0	0	1	1	1
Possible	1	0	0	0	1	1	0
Unrelated	2						
SANTA CLARA							
Definite	2	2	0	0	0	0	2
Probable	5	1	3	1	0	0	5
Possible	3	0	0	0	3	0	3
Unrelated	3						
Insufficient	1						
Unavailable	1						
SANTA CRUZ							
Probable	1	0	1	0	0	0	1
Unlikely	1						
Unrelated	1						
SHASTA							
Definite	1	1	0	0	0	0	1
Probable	1	1	0	0	0	0	1
Unrelated	1						
Unavailable	3						
SISKIYOU							
Definite	1	1	0	0	0	0	1
Probable	1	0	1	0	0	0	1
Unlikely	1	0	0	1	0	0	1
Unavailable	1						
SOLANO							
Definite	5	4	1	0	0	0	5
Probable	7	1	5	1	0	0	7
Possible	2	1	0	0	1	0	2
Asymptomatic	1	0	0	0	1	0	1
Unrelated	5						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
SONOMA							
Definite	9	8	0	0	1	0	9
Probable	12	4	5	1	2	2	10
Possible	5	0	1	3	1	3	2
Asymptomatic	2	1	0	0	1	0	2
Unrelated	13						
Unavailable	1						
STANISLAUS							
Definite	7	7	0	0	0	2	5
Probable	9	2	3	3	1	0	9
Possible	5	0	0	2	3	4	1
Unrelated	8						
Unavailable	3						
SUTTER							
Definite	2	2	0	0	0	0	2
Possible	1	0	0	1	0	1	0
TEHAMA							
Definite	1	1	0	0	0	1	0
Possible	3	0	2	1	0	2	1
TRINITY							
Unrelated	1						
TULARE							
Definite	4	2	0	0	2	0	4
Probable	2	1	0	1	0	1	1
Possible	6	0	0	5	1	5	1
Unlikely	4	0	0	1	3	4	0
Unrelated	2						
TUOLUMNE							
Probable	1	0	1	0	0	0	1
VENTURA							
Definite	1	1	0	0	0	0	1
Probable	2	0	0	2	0	0	2
Unrelated	2						
Unavailable	2						

Relationship[2]	TOTAL CASES	Type Of Exposure[3]				Intended Use[4]	
		Direct Contact	Drift	Residue	Other/ Unknown	Agricultural	Non-Agricultural
YOLO							
Definite	1	1	0	0	0	1	0
Probable	5	2	1	0	2	1	4
Possible	1	0	1	0	0	1	0
Unlikely	1	0	0	0	1	0	1
Asymptomatic	4	1	0	3	0	3	1
Unrelated	1						
Unavailable	2						

1. **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.
   The term "potentially related to pesticide exposure" refers to all cases reported to the program, some of which were later determined to be unrelated to pesticide exposure.

2. **Relationship:** Degree of correlation between pesticide exposure and resulting symptomatology.

   Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

   Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

   Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

   Unlikely : A correlation cannot be ruled out absolutely. Medical and/or physical evidence suggest a cause other than pesticide exposure.

   Indirect : Pesticide exposure is not responsible, but pesticide regulations or product label requirements contributed in some way, (e.g. heat stress while wearing chemical resistant clothing).

   Asymptomatic : Exposure occurred, but did not result in illness/injury. Cholinesterase depression without symptoms falls in this category.

   Unrelated : Definite evidence of cause other than pesticide exposure including exposures to chemicals other than pesticides. Since there is no exposure to pesticides, there are no entries under "Type of Exposure" or "Intended Use."

   Insufficient : The available information is inadequate to make an informed judgment on the relationship between pesticide exposure and the reported symptomatology. For submitted investigations, the investigator failed to make an adequate attempt to obtain the necessary information. Since a relationship to pesticide exposure cannot be determined, there are no entries under "Type of Exposure" or "Intended Use."

Unavailable : The available information is inadequate to make an informed judgment on the relationship between pesticide exposure and the reported symptomatology. For submitted investigations, the investigator made an adequate attempt to collect the necessary information, but was not able to do so (e.g., none of the parties concerned could be contacted). There usually needs to be more effort than to say the employee is not available for interview; other parties can often supply useful information. Since a relationship to pesticide exposure cannot be determined, there are no entries under "Type of Exposure" or "Intended Use."

3. **Type of Exposure:** Characterization of how an individual came in contact with a pesticide.

Direct Contact : An appreciable amount of pesticide contacted the individual's body surface. This includes: 1) sprays or squirts from application equipment; 2) leaks or spills whether or not related to the application; and 3) deliberate immersion (as when cleaning implements in a basin with antimicrobials). This excludes drift exposures.

Drift : Spray, mist, fumes, or odor carried from the target site by air. Drift must be related to an application or mix/load activity.

Residue : The part of a pesticide that remains in the environment for a period of time following an application or drift. This includes odor after the completion of an application.

Other/Unknown : Any of the following: 1) ingestion; 2) multiple routes of exposure; 3) residue from a spill; 4) exposure to smoke or pyrolitic products from a fire where pesticides are burning; 5) route of exposure is not known.

4. **Intended Use:** Agricultural/Non-Agricultural - Indicates whether the pesticide(s) were intended to contribute to the production of agricultural commodities.

Agricultural : The pesticide(s) were intended to contribute to the production of agricultural commodities, including livestock. This includes: 1) agricultural research facilities, 2) handling of raw agricultural commodities in packing houses, 3) drift from agricultural applications into non-agricultural areas, and 4) transportation and storage of pesticides on farm lands. It excludes forestry operations, although they are classified as agricultural for regulatory purposes. It also excludes manufacture, transportation, and storage of pesticides prior to arrival at the site of agricultural production.

Non-Agricultural : The pesticide(s) were not intended to contribute to the production of agricultural commodities. This includes: 1) residential pesticide uses, 2) structural pest control, 3) rights-of-way, 4) parks, 5) landscaped urban areas, and 6) manufacture, transportation and storage of pesticides except on farm lands.

5. **County:** Individual counties in California where the incident occurred. If a county is not listed, there were no reported illnesses for that county for the year.

Whom to Contact:

California Department of Pesticide Regulation
Worker Health and Safety Branch
Phone: (916) 445-4222.
Physical address: 1001 I St., Sacramento CA 95814-2828.
Mailing address: P.O. Box 4015, Sacramento, CA 95812-4015
Fax: (916) 445-4280
www.cdpr.ca.gov

About the Pesticide Illness Surveillance Program Data

Pesticide-related illnesses have been tracked within the state of California for more than 50 years. The California Environmental Protection Agency, Department of Pesticide Regulation (DPR) maintains a surveillance program which records human health effects of pesticide exposure. The Pesticide Illness Surveillance Program (PISP) documents information on adverse effects from pesticide products, whether elicited by the active ingredients, inert ingredients, impurities, or breakdown products. This program maintains a database, which is utilized for evaluating the circumstances of pesticide exposures resulting in illness. This database is consulted regularly by staff who evaluate(s) the effectiveness of the DPR pesticide safety programs and recommend changes when appropriate.

Cases Reported in California[1] with Documented[2] Pesticide Exposure Summarized by the Type of Illness and the Type of Pesticides 2003

Type of Illness[3]	Antimicrobials[4]		Cholinesterase Inhibitors[4]		Other Pesticides[4]		Total
	Occupational[5]	Non-Occupational[5]	Occupational[5]	Non-Occupational[5]	Occupational[5]	Non-Occupational[5]	
Systemic							
Systemic with Respiratory and Topical Effects	16	0	3	3	10	67	**99**
Systemic with Respiratory Effects	25	0	9	2	28	6	**70**
Systemic with Topical Effects	6	1	6	1	15	29	**58**
Systemic Only	14	4	11	3	29	14	**75**
Respiratory							
Respiratory with Topical Effects	15	0	3	0	13	51	**82**
Respiratory Only	35	2	1	1	9	11	**59**
Topical							
Eye Only	121	3	3	0	71	43	**241**
Skin Only	43	0	9	1	43	3	**99**
Eye and Skin	7	0	0	0	8	4	**19**
Asymptomatic							
Asymptomatic	4	2	5	1	2	27	**41**
TOTAL	**286**	**12**	**50**	**12**	**228**	**255**	**843**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Documented Pesticide Exposure:** Includes cases classified as definitely, probably, or possibly related to pesticide exposure as well as documented pesticide exposure that did not result in symptomatology.

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Type of Illness:** Categorization of the type of symptoms experienced.

Systemic : Any health effects not limited to the respiratory, skin and/or eye. Cases involving multiple illness symptom types including systemic symptoms are included in the systemic category.

Respiratory : Health effects involving any part of the respiratory tree.

Topical : Health effects involving only the eyes and/or skin. This excludes outward physical signs (miosis and lacrimation) related to effects on internal bodily systems. These signs are classified under 'Systemic.'

Asymptomatic : Exposure occurred, but did not result in illness/injury. Cholinesterase depression without symptoms falls in this category.

[4] **Type of Pesticide:** Type of pesticide based on functional class.

Antimicrobials : Pesticides used to kill or inactivate microbiological organisms (bacteria, viruses, etc.).

Cholinesterase Inhibitors : Pesticides known to inhibit the function of the cholinesterase enzyme.

Other Pesticides : Any pesticide that is not an antimicrobial or cholinesterase-inhibiting pesticide.

[5] **Occupational or Non-Occupational:** The relationship between the illness/injury and the individual's work

Occupational : Work related. The individual was on the job at the time of the incident. This includes both paid employees and volunteers working in similar capacity to paid employees.

Non-Occupational : Not work related. The individual was not on the job at the time of the incident. This category includes individuals on the way to or from work (before the start or after the end of their workday).

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Illnesses and Injuries Reported in California[1] Associated With[2] Pesticide Exposure Summarized by the Type of Activity and Type of Exposure 2003

Occupational[3]

Type of Activity[4]	Type of Exposure[5]								
	Drift	**Residue**	**Direct Spray/ Squirt**	**Spill/ Other Direct**	**Ingestion**	**Multiple**	**Other**	**Unknown**	**Total**
Mixer/Loader	18	1	7	35	0	0	1	3	65
Applicator	45	1	43	67	0	5	5	30	196
Mechanical	2	0	12	5	0	0	1	2	22
Packaging/Processing	9	7	0	2	0	0	0	0	18
Field Worker	19	58	1	1	0	0	0	2	81
Routine Indoor	32	15	2	2	1	0	16	0	68
Routine Outdoor	11	4	0	1	0	2	1	0	19
Manufacturing/Formulation	0	0	0	2	0	0	0	1	3
Transport/Storage/Disposal	0	0	0	7	0	1	6	0	14
Emergency Response	9	3	0	0	0	0	0	0	12
Other	7	13	9	7	0	2	4	1	43
Unknown	1	10	0	0	0	0	0	1	12
Total Occupational Cases	***153***	***112***	***74***	***129***	***1***	***10***	***34***	***40***	***553***

Non-Occupational[3]

Type of Activity[4]	Type of Exposure[5]								
	Drift	**Residue**	**Direct Spray/ Squirt**	**Spill/ Other Direct**	**Ingestion**	**Multiple**	**Other**	**Unknown**	**Total**
Applicator	4	0	0	3	0	0	1	0	8
Routine Indoor	104	6	1	0	1	3	0	0	115
Routine Outdoor	96	1	0	0	1	1	0	4	103
Other	4	0	0	4	12	0	1	0	21
Unknown	2	0	0	0	0	0	0	0	2
Total Non-Occupational Cases	***210***	***7***	***1***	***7***	***14***	***4***	***2***	***4***	***249***
Total Occupational/ Non-Occupational	**363**	**119**	**75**	**136**	**15**	**14**	**36**	**44**	**802**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Occupational Status:** Occupational or Non-Occupational

Occupational	: Work related. The individual was on the job at the time of the incident. This includes both paid employees and volunteers working in similar capacity to paid employees.
Non-Occupational	: Not work related. The individual was not on the job at the time of the incident. This category includes individuals on the way to or from work (before the start or after the end of their workday).

[4] **Type of Activity:** Activity of the injured individual at the time of exposure

Mixer/Loader	: Mixes and/or loads pesticides. This includes: (1) removing a pesticide from its original container, (2) transferring the pesticide to a mixing or holding tank, (3) mixing pesticides prior to application, (4) driving a nurse rig, or (5) transferring the pesticide from a mix/holding tank or nurse rig to an application tank.
Applicator	: Applies pesticides by any method or conducts activities considered ancillary to the application (e.g., cleans spray nozzles in the field).
Mechanical	: Maintains (e.g. cleans, repairs or conducts maintenance) pesticide contaminated equipment used to mix, load or apply pesticides as well as the protective equipment used by individuals involved in such activities. This excludes the following: 1) maintenance performed by applicators on their equipment incidental to the application; 2) maintenance performed by mixer/loaders on their equipment incidental to mixing and loading; 3) decontamination by HAZMAT teams.
Packaging/Processing	: Handles (packs, processes or retails agricultural commodities from the packing house to the final market place. Field packing of agricultural commodities is classified as FIELD WORKER.
Field Worker	: Works in an agricultural field performing tasks such as advising, scouting, harvesting, thinning, irrigating, driving tractor (except as part of an application), field packing, conducting cultural work in a greenhouse, etc. Researchers performing similar tasks in an agricultural field are also included.
Routine Indoor	: Conducts activities in an indoor environment with minimal expectation for exposure to pesticides. This includes people in offices and businesses, residential structures, etc. who are not handling pesticides.
Routine Outdoor	: Conducts activities in an outdoor environment with minimal expectation for exposure to pesticides. This excludes field workers in agricultural fields. This includes gardeners who are not handling pesticides.

Transport/ Storage/ Disposal	:	Transports or stores pesticides between packaging and preparation for use. This includes shipping, warehousing and retailing as well as storage by the end-user prior to preparation for use. Disposal of unused pesticides is also included in this activity. This excludes driving a nurse rig to an application site.
Emergency Response	:	Emergency Response Personnel (Police, fire, ambulance and HAZMAT personnel) responding to a fire, spill, accident or any other pesticide incident in the line of duty.
Other	:	Activity is not adequately described by any other activity category. This includes but is not limited to: 1) being inside a vehicle; 2) dog groomers not handling pesticides; 3) individuals handling pesticide treated wood; 4) two or more activities with potential for pesticide exposure.
Unknown	:	Activity is not known

[5] **Type of Exposure:** Characterization of how an individual came in contact with a pesticide.

Drift	:	Spray, mist, fumes, or odor carried from the target site by air. Drift must be related to an application or mix/load activity.
Residue	:	The part of a pesticide that remains in the environment for a period of time following an application or drift. This includes odor after the completion of an application.
Direct Spray/Squirt	:	Material propelled by the application or mix/load equipment. Contact with the material can be by direct projection or ricochet. This includes exposure of mechanics working on application or mix/load equipment when the material is forced out by pressure.
Spill/Other Direct	:	Any of the following: 1) Contact made during an application or mixing/loading operation where the material is not propelled by the equipment; 2) Expected direct contact during use (e.g. washing dishes in a disinfectant solution); 3) Leaks, spills, etc. not related to an application.
Ingestion	:	Intentional or unintentional oral ingestion.
Multiple	:	Contact with pesticides occurred through two or more mechanisms.
Other	:	Other known route of exposure not included in other exposure categories. This includes, but not limited to: 1) Residue from a spill and 2) Exposure to smoke or pyrolitic products from a fire where pesticides are burning.

Whom to Contact:

California Department of Pesticide Regulation
Worker Health and Safety Branch
Phone: (916) 445-4222.
Physical address: 1001 I St., Sacramento CA 95814-2828.
Mailing address: P.O. Box 4015, Sacramento, CA 95812-4015
Fax: (916) 445-4280
www.cdpr.ca.gov

About the Pesticide Illness Surveillance Program Data

Pesticide-related illnesses have been tracked within the state of California for more than 50 years. The California Environmental Protection Agency, Department of Pesticide Regulation (DPR) maintains a surveillance program which records human health effects of pesticide exposure. The Pesticide Illness Surveillance Program (PISP) documents information on adverse effects from pesticide products, whether elicited by the active ingredients, inert ingredients, impurities, or breakdown products. This program maintains a database, which is utilized for evaluating the circumstances of pesticide exposures resulting in illness. This database is consulted regularly by staff who evaluate(s) the effectiveness of the DPR pesticide safety programs and recommend changes when appropriate.

Illnesses and Injuries Reported by California Physicians[1] Associated With[2] Pesticide Exposure Summarized by Pesticide(s) and Type of Illness 2003

Pesticide[3]	Systemic/ Respiratory[4]		Topical[4]		TOTAL	
	Definite/ Probable	Possible	Definite/ Probable	Possible	Definite/ Probable	Possible
Organophosphates						
Azinphos-methyl	0	0	0	1	0	1
Chlorpyrifos	1	3	0	0	1	3
DDVP	0	1	0	0	0	1
Diazinon	1	0	0	0	1	0
Disulfoton	1	0	0	0	1	0
Malathion	6	0	0	1	6	1
N-Methyl Carbamates						
Aldicarb	1	0	0	0	1	0
Carbaryl	0	1	0	0	0	1
Methomyl	0	2	0	0	0	2
Propoxur	1	1	0	0	1	1
Thiodicarb	2	0	0	0	2	0
Pyrethrins and Pyrethroids						
Bifenthrin	1	1	3	0	4	1
Cyfluthrin	2	2	4	1	6	3
Cyhalothrin	0	0	2	0	2	0
Cypermethrin	3	0	1	0	4	0
Esfenvalerate	3	0	0	0	3	0
Permethrin	1	0	1	0	2	0
Tralomethrin	1	0	0	0	1	0
Other Pesticides						
3-Iodo-2-Propynyl-Butyl Carbamate	0	0	1	0	1	0
Abamectin	0	6	0	1	0	7
Acetamiprid	0	1	1	0	1	1
Adjuvant	0	1	0	0	0	1
Alkylphenol Ethoxylate	0	0	1	0	1	0
Aluminum Phosphide	13	0	1	1	14	1
Ammonia	1	0	0	0	1	0
Azoxystrobin	0	1	0	0	0	1
Borax	0	0	1	0	1	0
Calcium Hypochlorite	7	1	2	0	9	1

Pesticide[3]	Systemic/ Respiratory[4]		Topical[4]		TOTAL	
	Definite/ Probable	Possible	Definite/ Probable	Possible	Definite/ Probable	Possible
Chlorinated Trisodium Phosphate	1	0	0	0	1	0
Chlorine	7	0	1	0	8	0
Chloropicrin	106	4	70	0	176	4
Chlorothalonil	0	0	0	1	0	1
Copper Hydroxide	1	1	0	0	1	1
Copper Naphthenate	1	0	1	0	2	0
Copper Sulfate	0	0	1	0	1	0
Creosote	0	0	0	1	0	1
Cyanuric Acid	3	0	7	1	10	1
Fipronil	0	1	0	0	0	1
Glutaraldehyde	2	1	3	0	5	1
Glyphosate	0	0	5	5	5	5
Halosulfuron	0	0	1	0	1	0
Hydrogen Peroxide	1	0	2	0	3	0
Imidacloprid	0	1	0	0	0	1
Iprodione	1	0	0	0	1	0
Lime-sulfur	0	0	1	0	1	0
Lithium Hypochlorite	1	0	0	0	1	0
Mancozeb	1	0	0	0	1	0
Metaldehyde	1	0	0	0	1	0
Metam-potassium	14	0	4	0	18	0
Metam-sodium	17	0	2	0	19	0
Methyl Bromide	1	0	0	0	1	0
Oxadiazon	0	2	0	0	0	2
Ozone	2	0	0	0	2	0
PCNB	0	0	0	1	0	1
Paraquat	2	1	1	0	3	1
Pendimethalin	0	0	1	0	1	0
Peroxyacetic Acid	1	1	0	0	1	1
Phenolic Disinfectants	1	0	1	0	2	0
Potassium Peroxymonosulfate	0	0	1	0	1	0
Prometon	0	0	1	0	1	0
Propargite	0	0	1	0	1	0
Propiconazole	1	0	0	1	1	1
Pyridaben	0	1	0	0	0	1
Quaternary Ammonia	13	9	52	5	65	14
Siduron	0	0	1	0	1	0
Sodium Carbonate	0	1	0	0	0	1
Sodium Hypochlorite	38	9	61	10	99	19

Pesticide[3]	Systemic/ Respiratory[4]		Topical[4]		TOTAL	
	Definite/ Probable	Possible	Definite/ Probable	Possible	Definite/ Probable	Possible
Spinosad	0	1	0	0	0	1
Sulfur	1	7	2	4	3	11
Sulfur Dioxide	2	0	1	0	3	0
Sulfuryl Fluoride	4	3	0	0	4	3
Thiophanate-methyl	0	2	0	0	0	2
Thiram	0	0	1	0	1	0
Trichloromelamine	0	0	1	0	1	0
Triclopyr	0	3	0	0	0	3
Combinations of Antimicrobials	14	2	21	1	35	3
Combinations of Fumigants	12	0	0	0	12	0
Combinations of Fungicides	2	2	4	10	6	12
Combinations of Herbicides	1	5	6	2	7	7
Combinations of Insecticides Including ChE Inhibitor(s)	2	8	2	1	4	9
Combinations of Insecticides Without ChE Inhibitor(s)	12	5	6	4	18	9
Miscellaneous Combinations	12	16	4	19	16	35
Unknown Antimicrobials	0	2	3	1	3	3
Unknown Fumigants	0	3	0	0	0	3
Unknown Herbicides	0	1	0	0	0	1
Unknown Insecticides	2	1	0	0	2	1
Unknown Pesticides	2	2	0	0	2	2
TOTAL	**327**	**116**	**287**	**72**	**614**	**188**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Type of Pesticide:** Pesticides listed on this table are grouped according to frequent inquiries received by DPR. Other pesticides are then listed in alphabetical order.

[4] **Type of Illness:** Categorization of the type of symptoms experienced.

Systemic	:	Any health effects not limited to the skin and/or eye. Cases involving multiple illness symptom types including systemic symptoms are included in the systemic category.
Respiratory	:	Health effects involving any part of the respiratory tree.
Topical	:	Health effects involving only the eyes and/or skin. This excludes outward physical signs (miosis and lacrimation) related to effects on internal bodily systems. These signs are classified under 'Systemic.'

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About the Pesticide Illness Surveillance Program Data

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Summary of Cases Reported by California[1] as Associated With[2] Pesticide Exposure Summarized by Occupational Status and by Location of the Incident, 2003

Incident Setting[3]	Occupational Exposures[4]		Non-Occupational Exposures[4]		TOTAL	
	Definite/ Probable[2]	Possible[2]	Definite/ Probable[2]	Possible[2]	Definite/ Probable[2]	Possible[2]
Farm	48	63	0	0	**48**	**63**
Nursery	16	18	0	0	**16**	**18**
Forest	0	3	0	0	**0**	**3**
Livestock Production Facility	7	0	0	0	**7**	**0**
Crop/Livestock Processing Facility	41	15	0	0	**41**	**15**
Animal Premise (Veterinary Hospital, Kennels, not Livestock)	5	0	0	0	**5**	**0**
Single Family Home	10	7	80	9	**90**	**16**
Multi-unit Housing	6	2	126	10	**132**	**12**
Residential Institution	13	2	0	0	**13**	**2**
School	45	6	2	0	**47**	**6**
Prison	1	1	0	0	**1**	**1**
Hospital/Medical	46	3	1	0	**47**	**3**
Pesticide Manufacturing Facility	2	2	0	0	**2**	**2**
Industrial or Other Manufacturing Facility	6	0	0	0	**6**	**0**
Office/Business	21	11	0	0	**21**	**11**
Retail Establishment	17	3	0	0	**17**	**3**
Service Establishment	59	7	1	1	**60**	**8**
Wholesale Establishment	5	3	0	0	**5**	**3**
Road/Rail Or Utility Right Of Way	9	4	4	0	**13**	**4**
Park	4	3	0	0	**4**	**3**
Golf Course	1	3	0	0	**1**	**3**
Landscape, Lawn	0	0	1	0	**1**	**0**
Landscape, Other	4	1	1	5	**5**	**6**
Other (Telephone Poles, Fences, Etc)	17	5	3	0	**20**	**5**
Unknown	7	1	5	0	**12**	**1**
TOTAL	**390**	**163**	**224**	**25**	**614**	**188**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness and Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Incident Setting:** Location where the incident occurred. The location may not coincide with the application site.

Farm	: Areas where agricultural crops are grown. This excludes the following: 1) nurseries and greenhouses which are classified under NURSERY; 2) livestock and poultry farms; and 3) forestry operations.
Nursery	: Facilities (including greenhouses) growing and selling plants, bulbs, seeds, etc. This includes the production of seedlings for transplanting into agricultural fields or forests.
Forest	: Establishments engaged in the operation of timber tracts, tree farms, reforestation projects and other forests related activities. This excludes forest nurseries growing seedlings for reforestation projects.
Livestock Production Facility	: Ranches, dairies, feedlots, egg production facilities, hatcheries and other establishments involved in keeping, grazing or feeding livestock or poultry for the sale of them or their products. This includes veterinary services provided for livestock.
Crop/Livestock Processing Facility	: Facilities involved in packing, manufacturing or processing foods or beverages for human consumption and feed products for animals and fowl. This includes facilities that sort, grade and pack fresh fruits and vegetables.
Animal Premise (Veterinary Hospital, Kennels, Not Livestock)	: Veterinary services, animal kennels**,** animal control facilities, dog grooming facilities and other services provided for companion animals. This excludes livestock.
Single Family Home	: The house and other structures on property intended for use by a single family. This includes swimming pools, but excludes landscaped areas on the property.
Multi-Unit Housing	: Apartments and multi-plexes and other buildings on property. This includes swimming pools, but excludes landscaped areas on the property.
Residential Institution	: Dormitories, nursing homes, homeless shelters and similar facilities.
School	: Establishments that provide academic or technical instruction. This includes daycare centers.

Prison	: Establishments for the confinement and correction of offenders as ordered by courts of law. This includes California youth authority facilities.
Hospital / Medical	: Establishments that provide medical, surgical and other health services to people. This includes offices and clinics of doctors and dentists, hospitals, medical and dental laboratories, kidney dialysis centers and other health related facilities.
Pesticide Manufacturing Facility	: Facilities engaged in manufacture and/or formulation of pesticides.
Industrial Or Other Manufacturing Facility	: Facilities involved in the mechanical or chemical transformations of materials or substances into new products. This excludes: 1) facilities engaged in manufacture or formulation of pesticides; and 2) facilities engaged in treatment of wood to protect against pest damage.
Office/Business	: Commercial establishments including public and private business offices. This excludes retail establishments and service establishments.
Retail Establishment	: Businesses engaged in selling merchandise for personal or household consumption and providing services related to the products. This excludes restaurants which are classified under service establishment.
Service Establishment	: Establishments engaged in providing services to individuals, businesses and government. This includes restaurants, laundries, etc. This excludes medical service establishments.
Wholesale Establishment	: Establishments involved in the distribution of merchandise to retail establishments or other wholesale establishments. This excludes "wholesalers" who sell directly to the public.
Road/Rail Or Utility Right Of Way	: Roads, rails or utilities and adjacent right-of-way areas. This includes aqueducts, manholes, landscaped median strips and vehicles moving along roadways.
Park	: An area of public land set aside for recreation. This includes public swimming pool facilities**.** This excludes private recreational facilities such as amusement parks, physical fitness facilities, etc. which are classified under SERVICE ESTABLISHMENT.
Golf Course	: Land used for playing or practicing golf, including putting greens and driving ranges. This excludes miniature golf courses.
Landscape, Lawn	: Landscaped lawns. This excludes lawn areas in the following locations: 1) road/rail or utility right-of-ways; 2) parks; and 3) golf courses.
Landscape, Other	: Landscaped ornamental shrub and tree areas. This excludes ornamental shrub and tree areas in the following locations: 1) road/rail or utility right-of-ways; 2) parks; and 3) golf courses.
Other	: Location of exposure occurred at a site not adequately described in any other incident setting category. This includes, but is not limited to, telephone poles, fences, water supply systems and wastewater treatment plants.
Unknown	: The location of the incident is unknown.

[4] **Occupational Status:** Occupational or Non-Occupational

Occupational	: Work related. The individual was on the job at the time of the incident. This includes both paid employees and volunteers working in similar capacity to paid employees.
Non-Occupational	: Not work related. The individual was not on the job at the time of the incident. This category includes individuals on the way to or from work (before the start or after the end of their workday).

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Summary of Cases Reported in California[1] as Associated With[2] Pesticide Exposure Summarized by Gender, Age Distribution, by Type of Pesticide and by Type of Use
2003

Agricultural Use Pesticide Exposure Incidents[3]

Age Group	Pesticides other than Antimicrobial Pesticides[4]			Antimicrobial Pesticides[4]			TOTAL
	Male	Female	Unknown	Male	Female	Unknown	
0 - 9	28	30	0	0	0	0	**58**
10 - 14	19	11	0	0	0	0	**30**
15 - 19	14	13	0	1	0	0	**28**
20 - 29	37	27	0	8	1	0	**73**
30 - 39	36	27	0	1	1	0	**65**
40 - 49	30	22	0	5	0	0	**57**
50 - 59	19	8	0	2	0	0	**29**
60 - 69	7	4	0	0	0	0	**11**
70 +	1	0	0	0	0	0	**1**
Unknown	28	24	1	0	0	0	**53**
TOTAL	**219**	**166**	**1**	**17**	**2**	**0**	**405**

Non-Agricultural Use Pesticide Exposure Incidents[3]

Age Group	Pesticides other than Antimicrobial Pesticides[4]			Antimicrobial Pesticides[4]			TOTAL
	Male	Female	Unknown	Male	Female	Unknown	
0 - 9	2	2	0	0	0	0	**4**
10 - 14	2	0	0	0	1	0	**3**
15 - 19	1	1	0	16	10	0	**28**
20 - 29	23	7	0	37	36	0	**103**
30 - 39	16	12	0	44	36	0	**108**
40 - 49	14	12	0	21	32	0	**79**
50 - 59	10	2	0	14	13	0	**39**
60 - 69	3	5	0	2	5	0	**15**
70 +	0	2	0	0	0	0	**2**
Unknown	7	3	0	2	4	0	**16**
TOTAL	**78**	**46**	**0**	**136**	**137**	**0**	**397**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness and Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Intended Use:** Agricultural/Non-Agricultural - Indicates whether the suspected pesticide(s) is intended to contribute to the production of agricultural commodities.

Agricultural : The pesticide(s) were intended to contribute to the production of agricultural commodities, including livestock. This includes: 1) agricultural research facilities, 2) handling of raw agricultural commodities in packing houses, 3) drift from agricultural applications into non-agricultural areas, and 4) transportation and storage of pesticides on farm lands. It excludes forestry operations, although they are classified as agricultural for regulatory purposes. It also excludes manufacture, transportation, and storage of pesticides prior to arrival at the site of agricultural production.

Non-Agricultural : The pesticide(s) were not intended to contribute to the production of agricultural commodities. This includes: 1) residential pesticide uses, 2) structural pest control, 3) rights-of-way, 4) parks, 5) landscaped urban areas, and 6) manufacture, transportation and storage of pesticides except on farm lands.

[4] **Antimicrobial :** Pesticides used to kill or inactivate microbiological organisms (bacteria, viruses, etc.).

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Illnesses and Injuries of Application Workers Reported by California Physicians[1] Associated With[2] Pesticide Exposure Summarized by the Type of Equipment, Type of Activity and Occupational Status 2003

Occupational[3]

Type of Equipment[4]	Type of Activity[5]				
	Mixer/ Loader	Applicator	Flagger	Mechanic	Total
Airblast Sprayers	3	8	0	0	**11**
Ground, Boom Below/Behind	0	3	0	0	**3**
Ground Boom, Other or Unspecified	1	2	0	0	**3**
Power Dusters	0	1	0	0	**1**
Shank Injection without Tarps	0	3	0	0	**3**
Ground, Other or Unspecified	3	6	0	5	**14**
Aerosol Can	0	3	0	1	**4**
Back Pack Sprayer	0	11	0	0	**11**
Foggers	0	1	0	0	**1**
Hand-Held Dusters	0	1	0	0	**1**
Hand Pump Sprayer	3	5	0	0	**8**
Pressurized Hose-Line Sprayers	1	20	0	0	**21**
Unpressurized Hand-Held Spray Equipment	4	20	0	0	**24**
Hand, Other or Unspecified	1	10	0	0	**11**
Chamber	2	4	0	0	**6**
Tarp	0	1	0	0	**1**
Automatic Equipment, Chlorinators	1	2	0	7	**10**
Sprinkler Irrigation Equipment	1	1	0	1	**3**
Automatic Equipment, Other or Unspecified	5	6	0	7	**18**
Immersion Equipment	10	14	0	0	**24**
Implements with Handles	7	8	0	0	**15**
Implements without Handles	1	8	0	0	**9**
Manual Placement	0	13	0	0	**13**
Manual Application Methods, Other or Unspecified	10	17	0	0	**27**
Other	0	3	0	0	**3**
Unknown	12	25	0	1	**38**
Total Occupational Cases	**65**	**196**	**0**	**22**	**283**

Non-Occupational[3]

Type of Equipment[4]	Type of Activity[5]				
	Mixer/ Loader	**Applicator**	**Flagger**	**Mechanic**	**Total**
Aerosol Can	0	1	0	0	**1**
Foggers	0	1	0	0	**1**
Unpressurized Hand-held Spray Equipment	0	1	0	0	**1**
Implements without Handles	0	1	0	0	**1**
Manual Placement	0	2	0	0	**2**
Manual Application Methods, Other or Unspecified	0	2	0	0	**2**
Total Non-Occupational Cases	**0**	**8**	**0**	**0**	**8**
Total Occupational and Non-Occupational Cases	**65**	**204**	**0**	**22**	**291**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Occupational Status:** Occupational or Non-Occupational

Occupational : Work related. The individual was on the job at the time of the incident. This includes both paid employees and volunteers working in similar capacity to paid employees.

Non-Occupational : Not work related. The individual was not on the job at the time of the incident. This category includes individuals on the way to or from work (before the start or after the end of their workday).

[4] **Type of Activity:** Activity of the injured individual at the time of exposure

Mixer/Loader : Mixes and/or loads pesticides. This includes: (1) removing a pesticide from its original container, (2) transferring the pesticide to a mixing or holding tank, (3) mixing pesticides prior to application, (4) driving a nurse rig, or (5) transferring the pesticide from a mix/holding tank or nurse rig to an application tank.

Applicator : Applies pesticides by any method or conducts activities considered ancillary to the application (e.g., cleans spray nozzles in the field).

Flagger	:	Flags for an aerial application, either fixed-winged or helicopter.
Mechanic	:	Maintains (e.g. cleans, repairs or conducts maintenance) pesticide contaminated equipment used to mix, load or apply pesticides as well as the protective equipment used by individuals involved in such activities. This excludes the following: 1) maintenance performed by applicators on their equipment incidental to the application; 2) maintenance performed by mixer/loaders on their equipment incidental to mixing and loading; 3) decontamination by HAZMAT teams.

[5] **Type of Equipment Used:** Defines the type of application equipment regardless of who performed the application. If the type of equipment is not represented on the table, there were no cases involving that type of equipment for the year of the report.

Airblast Sprayers	:	Ground application equipment with a pump that delivers spray into an air stream created by a large fan at the back of the spray equipment.
Ground Boom Below/Behind	:	Ground application equipment with a spray boom located below or behind the equipment operator with the spray nozzles pointed downward.
Ground Boom, Other Or Unspecified	:	Ground application equipment with a spray boom. The following are excluded: 1) Ground Boom Below/Behind, 2) Over-The-Vine Boom, and 3) Electrostatic Sprayer.
Power Dusters	:	Ground application equipment used to apply dust formulated pesticides.
Shank Injection Without Tarps	:	Ground application equipment that uses a shank or other piece of equipment to directly apply a pesticide into the soil except when a tarp is placed over the soil, which is classified under shank injection with tarps. This also excludes surface applied pesticides that are subsequently incorporated into the soil by a cultivator.
Ground, Other Or Unspecified	:	Ground application equipment, unknown or unspecified. This includes two or more types of ground application
Aerosol Can	:	Disposable pressurized cans designed for intermittent use. The pesticide is propelled out of the can by an inert compressed gas propellant. This excludes foggers.
Back Pack Sprayer	:	Compressed air sprayer where the tank is worn on the back of the applicator.
Foggers	:	Disposable pressurized cans designed for the total release of the contents in a single use. The pesticide is propelled out of the can by an inert compressed gas propellant.
Hand-Held Dusters	:	Hand-held application equipment for granules or dust. This includes belly grinders, bellows, squeeze bulbs, etc.
Hand Pump Sprayer	:	Hand-held compressed air sprayer with small volume tanks (1 to 5 gallons). This excludes backpack sprayers.
Pressurized Hose-Line Sprayers	:	Hand-held spray equipment attached by a long hose to a power-pressurized tank. This excludes hose-end sprayers, which are classified under hand, other or unspecified.
Unpressurized Hand-Held Spray Equipment	:	Hand-held spray bottles (usually plastic) with built-in finger triggers.
Hand, Other Or Unspecified	:	Hand-held application equipment, other or unspecified. The equipment must propel the pesticide from a reservoir. This includes 1) hose-end sprayers, and 2) two or more types of hand-held application equipment. This excludes hand-held equipment already specified above.

Chamber	:	An enclosed, sealed chamber designed specifically for fumigating or sterilizing the contents of the chamber.
Tarp	:	Tarp placed over a commodity or structure and designed to restrict a fumigant to the application site.
Automatic Equipment, Chlorinators	:	Chlorination units that automatically inject chlorine into water for disinfection purposes. This includes chlorinators for swimming pools, packing houses and food processing plants.
Sprinkler Irrigation Equipment	:	Chemigation through sprinkler irrigation equipment.
Automatic Equipment, Other Or Unspecified	:	Equipment that automatically injects the pesticide to the target area. This includes equipment attached to milking machinery, dishwashers, etc. This excludes equipment already described above.
Immersion Equipment	:	Tanks, trays, sinks, etc. used for the dipping of animals, produce, bulbs, medical equipment, dishes, pots and pans, etc.
Implements With Handles	:	Mops, brushes, and other implements with handles.
Implements Without Handles	:	Cloths, towels, rags, sponges and other implements without handles.
Manual Placement	:	Manual placement of a pesticide directly to a target site. This includes bait stations, hand tossed pellets, and direct pouring of a pesticide onto a target surface from a container (such as pouring liquid chlorine directly into swimming pool water). This excludes the placement of fumigation pellet packs in chambers and under tarps.
Manual Application Methods, Other Or Unspecified	:	Manual application methods, other or unspecified. The pesticide is not propelled by any type of equipment. This includes two or more types of manual application methods. This excludes manual application method already described above.
Other	:	Any application methodology not described above. This includes two or more types of application equipment not elsewhere specified.
Unknown	:	The type of application equipment is not known.

Whom to Contact:

California Department of Pesticide Regulation
Worker Health and Safety Branch
Phone: (916) 445-4222.
Physical address: 1001 I St., Sacramento CA 95814-2828.
Mailing address: P.O. Box 4015, Sacramento, CA 95812-4015
Fax: (916) 445-4280
www.cdpr.ca.gov

About the Pesticide Illness Surveillance Program Data

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Hospitalization and Disability Associated with Illnesses/Injuries *Definitely or Probably Related* to Pesticide Exposure in California[1,2], Summarized by Occupational Status and Activity 2003

Occupational[3]

Activity[4]	Total Cases	Hospitalization			Disability		
		No. Cases	%	Unknown[5]	No. Cases	%	Unknown[6]
Mixer/Loader	63	0	0	0	10	15.9	2
Applicator	151	0	0	0	30	19.9	0
Mechanical	18	0	0	0	1	5.6	0
Packaging/Processing	9	0	0	0	4	44.4	0
Field Worker	21	2	9.5	0	6	28.6	0
Routine Indoor	52	0	0	0	9	17.3	0
Routine Outdoor	7	0	0	0	0	0	1
Manufacturing/Formulation	2	0	0	0	2	100	0
Transport/Storage/Disposal	9	0	0	0	1	11.1	0
Emergency Response	9	0	0	0	0	0	1
Other	38	0	0	1	3	7.9	2
Unknown	11	0	0	0	0	0	0
Total Occupational	**390**	**2**	**0.5**	**1**	**66**	**16.9**	**6**

Non- Occupational[3]

Activity[4]	Total Cases	Hospitalization			Disability		
		No. Cases	%	Unknown[5]	No. Cases	%	Unknown[6]
Applicator	7	0	0	0	0	0	1
Routine Indoor	104	0	0	0	0	0	8
Routine Outdoor	93	0	0	0	0	0	23
Other	19	6	31.6	0	4	21.1	4
Unknown	1	0	0	0	0	0	1
Total Non-Occupational	**224**	**6**	**2.7**	**0**	**4**	**1.8**	**37**
TOTAL CASES	**614**	**8**	**1.3**	**1**	**70**	**11.4**	**43**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Relationship:** Degree of correlation between pesticide exposure and resulting symptomatology.

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

[3] **Occupational Status:** Occupational or Non-Occupational

Occupational : Work related. The individual was on the job at the time of the incident. This includes both paid employees and volunteers working in similar capacity to paid employees.

Non-Occupational : Not work related. The individual was not on the job at the time of the incident. This category includes individuals on the way to or from work (before the start or after the end of their workday).

[4] **Type of Activity:** Activity of the individual at the time of exposure.

Mixer/Loader : Mixes and/or loads pesticides. This includes: (1) removing a pesticide from its original container, (2) transferring the pesticide to a mixing or holding tank, (3) mixing pesticides prior to application, (4) driving a nurse rig, or (5) transferring the pesticide from a mix/holding tank or nurse rig to an application tank.

Applicator : Applies pesticides by any method or conducts activities considered ancillary to the application (e.g., cleans spray nozzles in the field).

Flagger : Flags for an aerial application, either fixed-winged or helicopter.

Mechanical : Maintains (e.g. cleans, repairs or conducts maintenance) pesticide contaminated equipment used to mix, load or apply pesticides as well as the protective equipment used by individuals involved in such activities. This excludes the following: 1) maintenance performed by applicators on their equipment incidental to the application; 2) maintenance performed by mixer/loaders on their equipment incidental to mixing and loading; 3) decontamination by HAZMAT teams.

Packaging and Processing : Handles (packs, processes or retails agricultural commodities from the packing house to the final market place. Field packing of agricultural commodities is classified as FIELD WORKER.

Field Worker : Works in an agricultural field performing tasks such as advising, scouting, harvesting, thinning, irrigating, driving tractor (except as part of an application), field packing, conducting cultural work in a greenhouse, etc. Researchers performing similar tasks in an agricultural field are also included.

Routine Indoor : Conducts activities in an indoor environment with minimal expectation for exposure to pesticides. This includes people in offices and businesses, residential structures, etc. who are not handling pesticides.

Routine Outdoor : Conducts activities in an outdoor environment with minimal expectation for exposure to pesticides. This excludes field workers in agricultural fields. This includes gardeners who are not handling pesticides.

Manufacturing and Formulation	:	Manufactures, processes or packages pesticides. This includes "mixing" if it is done in a plant for application elsewhere.
Transport/ Storage/ Disposal	:	Transports or stores pesticides between packaging and preparation for use. This includes shipping, warehousing and retailing as well as storage by the end-user prior to preparation for use. Disposal of unused pesticides is also included in this activity. This excludes driving a nurse rig to an application site.
Emergency Response	:	Emergency Response Personnel (Police, fire, ambulance and HAZMAT personnel) responding to a fire, spill, accident or any other pesticide incident in the line of duty.
Other	:	Activity is not adequately described by any other activity category. This includes but is not limited to: 1) being inside a vehicle; 2) dog groomers not handling pesticides; 3) individuals handling pesticide treated wood; 4) two or more activities with potential for pesticide exposure.
Unknown	:	Activity is not known

[5] **Hospitalization Unknown:** Investigation did not specify whether hospitalization occurred or not.

[6] **Disability Unknown:** Investigation did not specify whether disability occurred or not.

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Hospitalization and Disability Associated with Illnesses/Injuries *Possibly Related* to Pesticide Exposure in California[1,2], Summarized by Occupational Status and Activity 2003

Occupational[3]

Activity[4]	Total Cases	Hospitalization			Disability		
		No. Cases	%	Unknown[5]	No. Cases	%	Unknown[6]
Mixer/Loader	2	0	0	0	2	100	0
Applicator	45	0	0	1	16	35.6	1
Mechanical	4	0	0	0	0	0	1
Packaging/Processing	9	0	0	0	5	55.6	0
Field Worker	60	0	0	0	11	18.3	4
Routine Indoor	16	0	0	0	4	25	0
Routine Outdoor	12	1	8.3	0	3	25	2
Manufacturing/Formulation	1	0	0	0	0	0	0
Transport/Storage/Disposal	5	0	0	0	0	0	0
Emergency Response	3	0	0	0	0	0	0
Other	5	0	0	0	0	0	0
Unknown	1	0	0	0	0	0	0
Total Occupational	**163**	**1**	**0.6**	**1**	**41**	**25.2**	**8**

Non- Occupational[3]

Activity	Total Cases	Hospitalization			Disability		
		No. Cases	%	Unknown[5]	No. Cases	%	Unknown[6]
Applicator	1	0	0	0	0	0	0
Routine Indoor	11	0	0	1	1	9.1	2
Routine Outdoor	10	0	0	0	0	0	2
Other	2	0	0	1	0	0	2
Unknown	1	0	0	0	0	0	1
Total Non-Occupational	**25**	**0**	**0**	**2**	**1**	**4**	**7**
Total Cases	**188**	**1**	**0.5**	**3**	**42**	**22.3**	**15**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Relationship:** Degree of correlation between pesticide exposure and resulting symptomatology.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Occupational Status:** Occupational or Non-Occupational

Occupational : Work related. The individual was on the job at the time of the incident. This includes both paid employees and volunteers working in similar capacity to paid employees.

Non-Occupational : Not work related. The individual was not on the job at the time of the incident. This category includes individuals on the way to or from work (before the start or after the end of their workday).

[4] **Type of Activity:** Activity of the individual at the time of exposure.

Mixer/Loader : Mixes and/or loads pesticides. This includes: (1) removing a pesticide from its original container, (2) transferring the pesticide to a mixing or holding tank, (3) mixing pesticides prior to application, (4) driving a nurse rig, or (5) transferring the pesticide from a mix/holding tank or nurse rig to an application tank.

Applicator : Applies pesticides by any method or conducts activities considered ancillary to the application (e.g., cleans spray nozzles in the field).

Flagger : Flags for an aerial application, either fixed-winged or helicopter.

Mechanical : Maintains (e.g. cleans, repairs or conducts maintenance) pesticide contaminated equipment used to mix, load or apply pesticides as well as the protective equipment used by individuals involved in such activities. This excludes the following: 1) maintenance performed by applicators on their equipment incidental to the application; 2) maintenance performed by mixer/loaders on their equipment incidental to mixing and loading; 3) decontamination by HAZMAT teams.

Packaging and Processing : Handles (packs, processes or retails agricultural commodities from the packing house to the final market place. Field packing of agricultural commodities is classified as FIELD WORKER.

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Routine Indoor : Conducts activities in an indoor environment with minimal expectation for exposure to pesticides. This includes people in offices and businesses, residential structures, etc. who are not handling pesticides.

Routine Outdoor : Conducts activities in an outdoor environment with minimal expectation for exposure to pesticides. This excludes field workers in agricultural fields. This includes gardeners who are not handling pesticides.

Manufacturing and Formulation : Manufactures, processes or packages pesticides. This includes “mixing” if it is done in a plant for application elsewhere.

Transport/ Storage/ Disposal : Transports or stores pesticides between packaging and preparation for use. This includes shipping, warehousing and retailing as well as storage by the end-user prior to preparation for use. Disposal of unused pesticides is also included in this activity. This excludes driving a nurse rig to an application site.

Emergency Response	:	Emergency Response Personnel (Police, fire, ambulance and HAZMAT personnel) responding to a fire, spill, accident or any other pesticide incident in the line of duty.
Other	:	Activity is not adequately described by any other activity category. This includes but is not limited to: 1) being inside a vehicle; 2) dog groomers not handling pesticides; 3) individuals handling pesticide treated wood; 4) two or more activities with potential for pesticide exposure.
Unknown	:	Activity is not known

[5] **Hospitalization Unknown:** Investigation did not specify whether hospitalization occurred or not.

[6] **Disability Unknown:** Investigation did not specify whether disability occurred or not.

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Agricultural Drift Cases Reported in California[1] Associated With[2] Pesticide Exposure Summarized by Application Sites
2003

Application Site[3]	Number of Cases[4]	Number of Incidents[5]
CITRUS		
Citrus (Other or Unspecified)	1	1
CUCURBITS		
Watermelons	1	1
FIBER CROP		
Cotton	4	2
FIXTURES		
Milking Equipment (Milking Machine, Etc.)	1	1
FORAGE CROP		
Alfalfa	2	1
FRUITING VEGETABLE		
Tomatoes	2	2
GRAIN		
Wheat	1	1
GRAPES		
Grapes	7	3
LEAFY/STEM VEGETABLE		
Celery	3	2
Lettuce	2	1
NON-CROP		
Soil	212	5
Uncultivated Agricultural Areas (Other or Unspecified)	2	2
NUT TREES		
Almonds	2	1
Walnuts	2	1
ORNAMENTAL		
Ornamental Plants (Other or Unspecified)	7	2
POME FRUIT		
Apples	2	2
ROOT CROP VEGETABLE		
Potatoes	4	4
STONE FRUIT		
Cherries	1	1
TOTAL	**256**	**33**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness and Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Application Sites:** Site of the pesticide application. For crops, this includes applications at the growing site and to the commodity while being packed for sale. For incidents involving drift, the intended application site is listed.

[4] **Number of Cases:** Indicates the number of individuals with illness or injury following of agricultural drift.

[5] **Incidents:** Indicates the number of episodes where agricultural pesticide drift occurred based on the application site. Each incident may include more than one case.

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Agricultural Drift Cases[1] Reported by California Physicians as Associated With[2] Pesticide Exposure Summarized by the Activity of the Exposed Person and by the Type of Application Equipment Used
2003

Type of Application Equipment Used [3]	Type of Activity [4]				TOTAL
	Routine Indoor	Routine Outdoor	Field Worker	Other	
Fixed Wing Aircraft	1	1	8	3	**13**
Helicopter	0	3	0	0	**3**
Airblast Sprayers	0	0	2	3	**5**
Power Dusters	0	1	0	0	**1**
Ground Boom, Other or Unspecified	0	3	0	1	**4**
Ground, Other or Unspecified	0	2	2	1	**5**
Shank Injection without Tarps	93	87	1	12	**193**
Pressurized Hose-Line Sprayers	0	0	6	0	**6**
Back Pack Sprayer	0	0	0	2	**2**
Hand, Other or Unspecified	1	0	0	0	**1**
Automatic Equipment, Chlorinators	0	0	0	1	**1**
Automatic Equipment, Other or Unspecified	0	0	0	1	**1**
Sprinkler Irrigation Equipment	8	7	0	4	**19**
Other	0	0	0	2	**2**
TOTAL	**103**	**104**	**19**	**30**	**256**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Type of Equipment Used:** Defines the type of application equipment regardless of who performed the application. If the type of equipment is not represented on the table, there were no cases involving that type of equipment for the year of the report.

Fixed Wing Aircraft	: Fixed wing aircraft.
Helicopter	: Helicopter.
Airblast Sprayers	: Ground application equipment with a pump that delivers spray into an air stream created by a large fan at the back of the spray equipment.
Power Dusters	: Ground application equipment used to apply dust formulated pesticides.
Ground, Other Or Unspecified	: Ground application equipment, unknown or unspecified. This includes two or more types of ground application equipment
Ground Boom, Other Or Unspecified	: Ground application equipment with a spray boom. The following are excluded: 1) Ground Boom Below/Behind, 2) Over-The-Vine Boom, and 3) Electrostatic Sprayer.
Shank Injection Without Tarps	: Ground application equipment that uses a shank or other piece of equipment to directly apply a pesticide into the soil except when a tarp is placed over the soil, which is classified under shank injection with tarps. This also excludes surface applied pesticides that are subsequently incorporated into the soil by a cultivator.
Pressurized Hose-Line Sprayers	: Hand-held spray equipment attached by a long hose to a power-pressurized tank. This excludes hose-end sprayers, which are classified under hand, other or unspecified.
Back Pack Sprayer	: Compressed air sprayer where the tank is worn on the back of the applicator.
Hand, Other or Unspecified	: Hand-held application equipment, other or unspecified. The equipment must propel the pesticide from a reservoir. This includes 1) hose-end sprayers, and 2) two or more types of hand-held application equipment. This excludes hand-held equipment already specified above.
Automatic Equipment, Chlorinators	: Chlorination units that automatically inject chlorine into water for disinfection purposes. This includes chlorinators for swimming pools, packing houses and food processing plants.
Automatic Equipment, Other Or Unspecified	: Equipment that automatically injects the pesticide to the target area. This includes equipment attached to milking machinery, dishwashers, etc. This excludes equipment already described above.
Sprinkler Irrigation Equipment	: Chemigation through sprinkler irrigation equipment.
Other	: Any application methodology not described above. This includes two or more types of application equipment not elsewhere specified.

[4] **Type of Activity:** Activity of the individual at the time of exposure.

Routine Indoor : Conducts activities in an indoor environment with minimal expectation for exposure to pesticides. This includes people in offices and businesses, residential structures, etc. who are not handling pesticides.

Routine Outdoor : Conducts activities in an outdoor environment with minimal expectation for exposure to pesticides. This excludes field workers in agricultural fields. This includes gardeners who are not handling pesticides.

Field Worker : Works in an agricultural field performing tasks such as advising, scouting, harvesting, thinning, irrigating, driving tractor (except as part of an application), field packing, conducting cultural work in a greenhouse, etc. Researchers performing similar tasks in an agricultural field are also included.

Other : Activity is not adequately described by any other activity category. This includes but is not limited to: 1) being inside a vehicle; 2) dog groomers not handling pesticides; 3) individuals handling pesticide treated wood; 4) two or more activities with potential for pesticide exposure.

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Illnesses and Injuries in California[1] Associated With Pesticide Residue in Agricultural Fields, 1982-2003

Year	Systemic/ Respiratory[2]		Topical[2]		TOTAL
	Definite/ Probable[3]	Possible[3]	Definite/ Probable[3]	Possible[3]	
1982	23	43	48	117	**231**
1983	19	29	41	96	**185**
1984	7	7	50	114	**178**
1985	20	20	161	168	**369**
1986	29	10	156	63	**258**
1987	58	80	53	182	**373**
1988	57	35	75	204	**371**
1989	17	22	30	93	**162**
1990	3	32	11	119	**165**
1991	16	37	7	87	**147**
1992	11	57	19	112	**199**
1993	10	38	2	67	**117**
1994	33	31	5	42	**111**
1995	20	48	74	89	**231**
1996	29	37	15	60	**141**
1997	83	44	20	62	**209**
1998	40	19	5	47	**111**
1999	23	17	0	42	**82**
2000	21	30	2	22	**75**
2001	7	22	0	17	**46**
2002	30	23	13	12	**78**
2003	4	17	4	33	**58**
Total	**560**	**698**	**791**	**1848**	**3897**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness and Surveillance Program.

[2] **Type of Illness:** Categorization of the type of symptoms experienced.

Systemic	:	Any health effects not limited to the respiratory or skin and/or eye. Cases involving multiple illness symptom types including systemic symptoms are included in the systemic category.
Respiratory	:	Health effects involving any part of the respiratory tree.
Topical	:	Health effects involving only the eyes and/or skin. This excludes outward physical signs (miosis and lacrimation) related to effects on internal bodily systems. These signs are classified under 'Systemic.'

[3] **Relationship of illness/injury to exposure:** Includes cases classified as definitely, probably or possibly related to pesticide exposure.

Definite	:	High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.
Probable	:	Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.
Possible	:	Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

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Incidents Involving *Field Workers* Reported in California[1] Associated With[2] Pesticide Residue Exposure Summarized by Crop and Type of Illness
2003

Crop	Systemic/ Respiratory[3]		Topical[3]		TOTAL
	Definite/ Probable	Possible	Definite/ Probable	Possible	
CITRUS					
Oranges	0	1	0	0	1
CUCURBITS					
Cantaloupes	0	1	0	0	1
FRUITING VEGETABLE					
Peppers	0	0	0	2	2
Tomatoes	0	1	0	1	2
GRAPES					
Grapes	0	2	4	23	29
LEAFY/STEM VEGETABLE					
Lettuce	0	0	0	1	1
NUT TREES					
Almonds	0	0	0	2	2
Pistachios	0	0	0	1	1
ORNAMENTAL					
Ornamental Plants (Other or Unspecified)	4	11	0	0	15
POME FRUIT					
Apples	0	1	0	1	2
STONE FRUIT					
Peaches	0	0	0	1	1
Plums	0	0	0	1	1
TOTAL	**4**	**17**	**4**	**33**	**58**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness and Surveillance Program.

[2] **Associated With:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Type of Illness:** Categorization of the type of symptoms experienced.

Systemic : Any health effects not limited to the respiratory or skin and/or eye. Cases involving multiple illness symptom types including systemic symptoms are included in the systemic category.

Respiratory : Health effects involving any part of the respiratory tree.

Topical : Health effects involving only the eyes and/or skin. This excludes outward physical signs (miosis and lacrimation) related to effects on internal bodily systems. These signs are classified under 'Systemic.'

Whom to Contact:

California Department of Pesticide Regulation
Worker Health and Safety Branch
Phone: (916) 445-4222.
Physical address: 1001 I St., Sacramento CA 95814-2828.
Mailing address: P.O. Box 4015, Sacramento, CA 95812-4015
Fax: (916) 445-4280
www.cdpr.ca.gov

About the Pesticide Illness Surveillance Program Data

Pesticide-related illnesses have been tracked within the state of California for more than 50 years. The California Environmental Protection Agency, Department of Pesticide Regulation (DPR) maintains a surveillance program which records human health effects of pesticide exposure. The Pesticide Illness Surveillance Program (PISP) documents information on adverse effects from pesticide products, whether elicited by the active ingredients, inert ingredients, impurities, or breakdown products. This program maintains a database, which is utilized for evaluating the circumstances of pesticide exposures resulting in illness. This database is consulted regularly by staff who evaluate(s) the effectiveness of the DPR pesticide safety programs and recommend changes when appropriate.

Pesticide-Associated Illnesses and Injuries Reported In California Schools[1, 2] by Exposure Category, Pesticide Type and Illness Symptoms 2003

Exposure[3]	Systemic/Respiratory[4]			Topical[4]			TOTAL
	Antimicrobials[5]	Cholinesterase Inhibitors[5]	Other Pesticides[5]	Antimicrobials[5]	Cholinesterase Inhibitors[5]	Other Pesticides[5]	
Drift	5	0	3	2	0	3	**13**
Residue	2	0	2	0	0	13	**17**
Direct Spray/Squirt	0	0	0	4	0	1	**5**
Spill/Other Direct	1	0	0	13	0	2	**16**
Ingestion	1	0	0	0	0	0	**1**
Multiple Exposures	1	0	0	0	0	0	**1**
TOTAL	**10**	**0**	**5**	**19**	**0**	**19**	**53**

[1] **Source:** California Department of Pesticide Regulation, Pesticide Illness Surveillance Program.

[2] **Pesticide Associated:** Includes cases classified as definitely, probably or possibly related to pesticide exposure

Definite : High degree of correlation between pattern of exposure and resulting symptomatology. Requires both medical evidence (such as measured cholinesterase inhibition, positive allergy tests, characteristic signs observed by medical professional) and physical evidence of exposure (environmental and/or biological samples, exposure history) to support the conclusions.

Probable : Relatively high degree of correlation exists between the pattern of exposure and the resulting symptomatology. Either medical or physical evidence is inconclusive or unavailable.

Possible : Some degree of correlation evident. Medical and physical evidence are inconclusive or unavailable.

[3] **Type of Exposure:** Characterization of how an individual came in contact with a pesticide. Exposure categories not listed on the table indicate there were no illnesses that occurred under that category.

Drift	: Spray, mist, fumes, or odor carried from the target site by air. Drift must be related to an application or mix/load activity.
Residue	: The part of a pesticide that remains in the environment for a period of time following an application or drift. This includes odor after the completion of an application.
Direct Spray/Squirt	: Material propelled by the application or mix/load equipment. Contact with the material can be by direct projection or ricochet. This includes exposure of mechanics working on application or mix/load equipment when the material is forced out by pressure.
Spill/Other Direct	: Any of the following: 1) Contact made during an application or mixing/loading operation where the material is not propelled by the equipment; 2) Expected direct contact during use (e.g. washing dishes in a disinfectant solution); 3) Leaks, spills, etc. not related to an application.
Ingestion	: Intentional or unintentional oral ingestion.
Multiple	: Contact with pesticides occurred through two or more mechanisms.

[4] **Type of Illness:** Categorization of the type of symptoms experienced.

Systemic	: Any health effects not limited to the respiratory, skin and/or eye. Cases involving multiple illness symptom types including systemic symptoms are included in the systemic category.
Respiratory	: Health effects involving any part of the respiratory tree.
Topical	: Health effects involving only the eyes and/or skin. This excludes outward physical signs (miosis and lacrimation) related to effects on internal bodily systems. These signs are classified under 'Systemic.'
Asymptomatic	: Exposure occurred, but did not result in illness/injury. Cholinesterase depression without symptoms falls in this category.

[5] **Type of Pesticide:** Type of pesticide based on functional class.

Antimicrobials	:	Pesticides used to kill or inactivate microbiological organisms (bacteria, viruses, etc.).
Cholinesterase Inhibitors	:	Pesticides known to inhibit the function of the cholinesterase enzyme.
Other Pesticides	:	Any pesticide that is not an antimicrobial or cholinesterase-inhibiting pesticide.

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